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30)

Raman / Batch Scale Ethylene Polymerization

Purpose: Test Raman & probes in batch reactor in 96-G.

Low Warm up 70
 Delay 1
 Delay/Acquisition 240
 No. Acq 100

Time	Sample File	Comments
9:45	BR96G 0001 0002 0003 0004 0005 0006 0007 0008	Nitrogen at 100 psig. 30 sec acquisition, 33°C
		changed to 251 psig N_2 @ 33°C.

10:15 BR96G

all (30 sec) ↑
 acquisition
 time
 before
 arrow

10:20 BRIC4 0001

28°C, 68 psig isobutane, not stirred, pushed in with C_2

BR96GIC4

Isobutane " R2000

BR96GIC4A

" " Galactos

BR96GIC4S700RPM

700 RPM, 59 psig, 28°C

BR Stir

" " "

BR⁹⁶ Stir

" " "

BR No Stir

Turned off stirring

BR Stir again

Turned stirring back on @ 700 rpm - 59 psig

11:15

BR00001

Adjusted temps to 60.1°C on IC4 in reactor. 1272 RPM = 69 psig

60 sec

Low Warm up

Post 2 sec

BR00002

Same as 0001

BR00003

Changed reactor temp to ~73°C during this scan, 74.0°F, P=170 psig

BR00004

Stable at 73.1°C, 169 psig

BR00005

Change T to 80°C on this scan; 80.6, 196 psig added.

BR00006

80.2°C, 195 psig, stable.

BR00007

Change to 90°C at pt: 91°C 242 psig

BR00008

Stable 90°C, 237 psig.

BR00009

Transition to 100°C, 100.5°C, 283 psig

BR00010

Stable 99.9 + 285 psig.

BR00011

Go to 105°C; 105.2, 315 psig

BR00012

Stable 105.3°C, 316 psig

BR00013

60.1, P=129 psig

BR00014

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DATE

Raman / Bench Scale Ethylene Polymerization

R_c

Purpose: Measure ethylene & isobutane in liquid reactor contents. 12" probe		
Time	File	Strainer On at 698 rpm
1400	BRExxxx	Start at 60°C, add C ₂ to iC ₄ at 60°. 128 psig iC ₄ Put 200 psig C ₂ for target total P = 328 psig at 60°C.
1416	BRE00001	T = 60.0°C, P = 330 psig (estimate 205 psig C ₂)
	BRE00002	Stable at 60°C / 333 psig
	BRE00003	Stable at 60°C / 333 psig
	BRE00004	Change T to 80°C / 73°C. Actual 73.8 & 400 psig
	BRE00005	✓ 73.1°C & 397 psig
	BRE00006	Transition to 80°C. Actual = 438 psig T = 80.8
	BRE00007	Stable at 80.1°C / 435 psig
	BRE00008	Stable at 80.1°C / 435 psig
	BRE00009	Transition to 90°C: 91.1°C / 500 psig Actual
	BRE00010	T = 89.9°C P = 493 psig
	BRE00011	T = 89.9°C P = 493 psig
	BRE00012	T = 107°C P = 605 psig Shows fluorescence
	BRE00013	T = 105°C P = 592 psig
	BRE00014	T = 100.1 P = 579 psig
	BRE00015	T = 100.7 P = 565 psig
all 5"	BRE00016	Probe installed in reactor head Changed to gas phase / 5" probe in mid run. T = 99.9°C P = 537 psig
gas phase probe	BRE00017	T = 99.8 P = 559
	BRE00018	T = 80.6 P = 440
	BRE00019	T = 80.2 P = 438
	BRE00020	Changing in H ₂ to determine if it can be detected. 140 psig DP. of a 340 cc vessel. P = 450 ⁴⁷² in reactor, now 422
	BRE00021	Changed more H ₂ , 225 psig DP more, P = 479 at 79.8°C
	BRE00022	Second spectrum at this condition. (wired result) Real high N ₂ peak
12" probe	BRE00023	Changed probe to 12" liquid probe T = 80.2°C P = 487 psig
	BRE00024	Repeat of 23, 80° & 483 psig
	BRE00025	Add more H ₂ . DP = 225 psig, of a 340 cc
	BRE00026	T = 80.1 P = 535 psig, see H ₂ at 588 cm ⁻¹
	BRE00027	T = 80 P = 533 repeat of 26.
	BRE00028	T = 80 P = 533
	BRE00029	T = 80 P = 533

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